

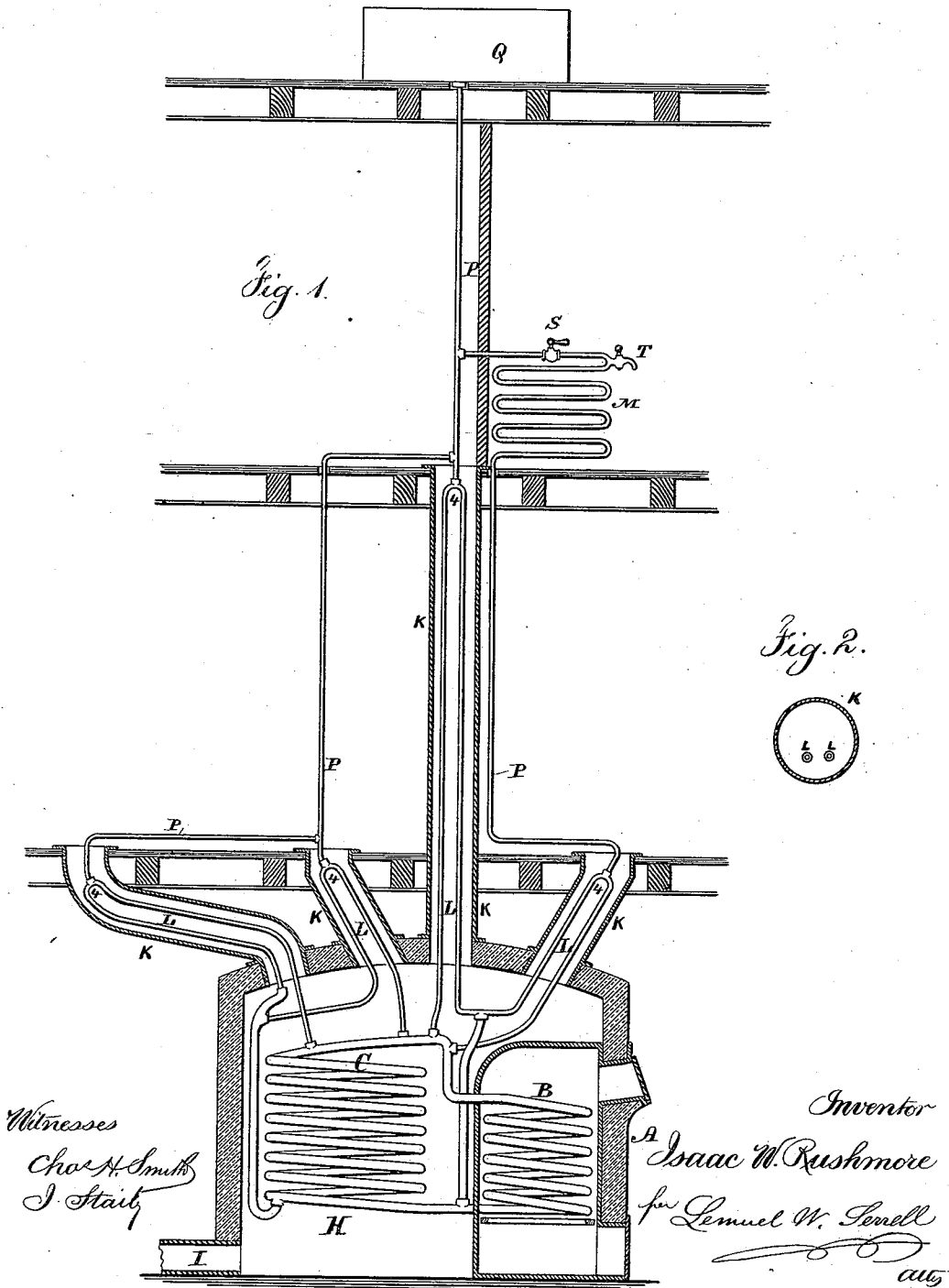
(No Model.)

I. W. RUSHMORE.

APPARATUS FOR HEATING BUILDINGS.

No. 361,784.

Patented Apr. 26, 1887.



Witnesses
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HEATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 361,784, dated April 26, 1887.

Application filed May 17, 1886. Serial No. 202,384. (No model.)

To all whom it may concern:

Be it known that I, ISAAC W. RUSHMORE, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Apparatus for Heating Buildings, of which the following is a specification.

Furnaces have been constructed with a coil or jacket through which water is caused to circulate by the action of the heat of the furnace, and there have been radiating-coils within an air-chamber for heating the atmosphere, and such atmosphere has passed into the apartments or rooms through tubes or flues. In practice it is found that with heaters having an air-chamber and lateral air-pipes, whether a furnace alone is used or whether hot water or steam is used in such air-chamber, in cold weather the air in the lateral air-pipes becomes chilled, and the column of cold or cool air at the distant end of the air-flue partially or entirely checks the circulation of warm air from the heated-air chamber through such lateral air flues or pipes.

The object of my present invention is to promote the circulation of the heated air through the tubes or flues that pass from the furnace-chamber to the respective rooms, and at the same time to increase the radiating-surface of the hot-air pipes.

In the drawings, Figure 1 is a vertical section showing portions of the building and of the furnace and of the hot-air pipes or flues with my improvements applied thereto, and Fig. 2 is a cross-section of one of the hot-air flues.

The furnace A is of any suitable character, and within the same is by preference a coil of pipe, B; but a water-jacket might be used in place of a coil of pipe.

C is a coil of pipes through which the hot water is caused to circulate, and this coil is within the air-chamber H, to which the atmosphere is admitted through an opening, I, as usual, and from this air-chamber H the hot-air pipes or flues K pass to the different rooms or portions of the building to be heated.

As my improvements are available with any arrangement of hot-air pipes or flues it is unnecessary to describe these parts any more fully.

My present improvements are available with

hot-air flues that pass off in any direction; but the utility is more apparent in the flues that have but a slight inclination.

From the heating-coils C, I pass along through the hot-air flues K the circulating-pipes L. These circulating-pipes are double in each flue and open into each other at the upper and outer ends, 4, and at the hot-air chamber the circulating-pipes L branch out from the coil-pipes C at different elevations, so that the hot water will pass off near the upper parts of the coil C through the circulating-pipes L and back again to the lower portions of the coil-pipes C, thereby insuring a rapidity of circulation of the hot water within the air pipes or flues K, so as to warm such air and promote the rapidity of circulation and cause such warm air to pass along the pipes, which are but slightly inclined, with greater rapidity than otherwise.

In all hot-water-circulating apparatus it is necessary to maintain the continuity of the column of water and to prevent the accumulation of steam or gases in the higher portions of the coils. With my present improvement any such accumulation of air or gases in the circulating-pipes L would effectually prevent the apparatus operating reliably. To avoid this difficulty I provide branch pipes P, extending above the upper and outer ends, 4, of the circulating-pipes L, and to these branch pipes P cocks may be applied for allowing the air to be blown off periodically; but as there is usually a water-cistern in an elevated position within the dwelling-house I prefer to make use of said cistern for maintaining the necessary water-supply to the heating apparatus, and for allowing the escape of air and gases, and for preventing the accumulation of steam-pressure. With this object in view, the pipes P are continued upwardly until they reach the reservoir Q, and it is usually preferable to unite these branch pipes P into one pipe where it passes into the reservoir; and by placing these pipes at an upward inclination any air or steam will pass off through the water of the reservoir.

It is often difficult to obtain the necessary supply of hot water in all parts of a building. I therefore make use of the pipes P for conveying hot water to any desired portion of the

rooms or building; but in order to be able to draw such hot water it is preferable to provide a cock, S, in the pipe P above the cock T, from which the hot water is drawn, so that the water from the reservoir Q may pass down into the furnace-pipes through some other portions of the branch pipes to supply the place of the hot water that is drawn from one of the cocks T. It is to be understood that the cock S should be opened after the cock T has been closed.

In some rooms in distant portions of dwelling-houses—such, for instance, as bath-rooms or water-closets—difficulty arises in obtaining the necessary heat in cold weather. I have added to my aforesaid apparatus the radiating-coil M within one of the rooms, the same being a continuation from one of the circulating-pipes L, passing through one of the heating-flues, in order that the hot water may circulate through this coil M and heat the room by direct radiation, instead of by induced heat, the return being through one of the other circulating-pipes L.

I claim as my invention—

1. The combination, with the air-chamber and hot-air pipes or flues leading off nearly horizontally from such chamber, of a furnace, a coil of pipe within the furnace, the circulating-pipes L, passing from the coil along through the said hot-air flues and returning to the furnace, and a pipe connecting to the highest part of the pipes L, for allowing the escape of air

and steam and for supplying water, substantially as set forth.

2. The combination, with the furnace and the air-chamber around the same, of the hot-air flues passing off from such chamber, and hot-water-circulating pipes within such flues, a reservoir for supplying water, and a branch pipe to such reservoir from the upper and outer ends of the circulating-pipes, substantially as set forth.

3. The combination, with the furnace and air-chamber and the hot-air flues passing off laterally, of circulating hot-water pipes within the hot-air flues, a coil within the furnace for heating the water, a reservoir, and a connection between the upper and outer parts of the circulating-pipes and the reservoir, substantially as set forth.

4. The furnace-coil for heating water, the air-chamber, and the hot-air flues passing off from the air-chamber, in combination with the hot-water-circulating pipes within the hot-air flues and connected to the coil, and radiator-pipes connected to the outer ends of two of the circulating-pipes that pass through the hot-air flues, substantially as set forth.

Signed by me this 12th day of May, A. D. 1886.

ISAAC W. RUSHMORE.

Witnesses:

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